srcdisplay

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Abstract

Displays an image overlayed with the positions of detected sources.

1 Instruments/Modes

Instrument	Mode
MOS, PN, OM	All imaging modes

2 Use

pipeline processing	no
interactive analysis	yes

3 Description

This task displays a given image and plots the positions of sources listed in a separate sourcelist file.

The input image is specified via the parameter `imageset` and the sourcelist file (generated by eg **eboxdetect**, **emldetect**, **srcmatch** or **ewavelet**) is specified through the `boxlistset` parameter.

Circles are used to depict the source positions. The radius of these circles can be set using the `sourceradius` parameter. A optional ID label can also be displayed alongside the circle, corresponding to the row number of that source in the input source list. This can be enabled through the `uselabel` parameter. This helps the user to refer back to source properties documented in the source list.

These circles are in fact Ds9-type regions, which can be written out to a file for future use (for example, when running a later DS9 session) by setting `withregionfile` to true, and specifying the desired file name via the `regionfile` parameter.

Note that the current version computes the regions in terms of equatorial coordinates, as opposed to raw image coordinates in previous versions. This means that the task can overlay source positions taken from a given source list onto *any* image, eg a PN sourcelist can be overlayed on a MOS1 image, as long as the image contains WCS information that maps the pixel grid onto equatorial coordinates.

3.1 Examples

To overlay the sourcelist `srclist.ds` generated previously by **eboxdetect** on an image `image.ds` the following command can be used:

```
srcdisplay imageset=image.ds boxlistset=srclist.ds
```

This would overlay circles, each of radius 5 pixels, around each source detected by **eboxdetect**. To overlay circles of radius 0.01 degrees, use the following:

```
srcdisplay imageset=image.ds boxlistset=srclist.ds sourceradius=0.01
```

To perform the same as above, but also write out a DS9 region file named `regions.txt`, detailing the source regions corresponding to the displayed circles,the following command could be used:

```
srcdisplay imageset=image.ds boxlistset=srclist.ds sourceradius=0.01 withregionfile=true
regionfile=regions.txt
```

4 Parameters

This section documents the parameters recognized by this task (if any).

Parameter	Mand	Type	Default	Constraints
boxlistset	yes	data-set	boxlist.ds	none

Name of dataset containing source list, output from **eboxdetect**.

withimageset	no	boolean	true	true|false

If set to `true` a new image data set is given in parameter `imagset`.

imageset	no	data-set	image.ds	none

The image on which the positions of detected sources are displayed. For `withimageset=false` no new image data set shall be displayed but the sources in `boxlistset` will be marked on the image in the currently active Ds9 session.

sourceradius	no	float	0.01	0.0001 $\leq$ `sourceradius` $\leq$ 2

The radius of the displayed circles for each source, in degrees.

includesources	no	boolean	true	none

If true, then the DS9 region descriptor generated for each source is such that it INCLUDES the area bounded by the circle; otherwise it includes everything BUT this area.

uselabel	no	boolean	false	none

If true, a number is displayed alongside the source position, corresponding to the row number of that source in the input source list.

withregionfile	no	boolean	true	none

If true, then a file of name `regionfile` is written out, containing a list of DS9-type regions for each source, corresponding to the displayed circles.

regionfile	no	file-name	regionfile.txt	none

The name of the region file.

overlay	no	boolean	false	true|false

If set to `false` any previously existing source region markers on the active image will be deleted before the new ones are displayed. `overlay=true` suppresses this so any existing source markers will be left unmodified. This is useful for e.g., comparing the results of two independent source detection runs on the same image.

srccolor	no	string	white	black |white |red |green |blue |cyan |magenta |yellow

The color of the source markers - useful in conjunction with the `overlay` parameter to control the display of two or more source lists on the same image.

5 Errors

This section documents warnings and errors generated by this task (if any). Note that warnings and errors can also be generated in the SAS infrastructure libraries, in which case they would not be documented here. Refer to the index of all errors and warnings available in the HTML version of the SAS documentation.

error(UnableToCreateFile *(error)*
: Cannot open a file of corresponding to the parameter `regionfile`.

invalidWCS *(warning)*
: the image does not contain a WCS entry describing a projection from image coordinates to equatorial coordinates.
corrective action: continue

NoBoxSizePresent *(warning)*
: the source list does not contain a column `BOX_SIZE`. This has no affect on the plotting but may affect other tools using the srcdisplay library.
corrective action: continue

NoPosnErrorsPresent *(warning)*
the source list does not contain a column RADEC_ERR. This has no affect on the plotting but may affect other tools using the srcdisplay library.
corrective action: continue

6 Input Files

1. A **eboxdetect** source list output. This is a dataset in which the first table must contain the following columns:

   - RA, of type real-64.
   - DEC, of type real-64.

   and optionally:

   - RADEC_ERR, of type real-32.
   - BOX_SIZE, of type real-32.

2. An image dataset. This must contain a block corresponding to an n x m array. It must also contain WCS information that describes the mapping from image coordinates to equatorial coordinates.

7 Output Files

1. A DS9-compatible region file. This is a text file containing region descriptions for each source. This is only written out if `withregionfile` is true.

8 Algorithm

1. `Read in source list and generate source regions for each source, using their positions in pixels. Write these regions to a temporary file if withregionfile is false, otherwise to a permanent file with a name corresponding to the parameter regionfile.`
2. `Invoke an imgdisplay session, using the image specified in imageset, and the region file name as arguments.`

9 Comments

- The ID labeling is currently based on the ROW number. A source list could have its own identification scheme, eg a SRC_NUM or SRCNUM column that contains an ID number for each source, which may cause slight confusion. Support is planned for that in the near future.

References